Epidermal growth factor receptor immunohistochemistry: New opportunities in metastatic colorectal cancer

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Abstract

The treatment of cancer is becoming more precise, targeting specific oncogenic drivers with targeted molecular therapies. The epidermal growth factor receptor has been found to be over-expressed in a multitude of solid tumours. Immunohistochemistry is widely used in the fields of diagnostic and personalised medicine to localise and visualise disease specific proteins. To date the clinical utility of epidermal growth factor receptor immunohistochemistry in determining monoclonal antibody efficacy has remained somewhat inconclusive. The lack of an agreed reproducible scoring criteria for epidermal growth factor receptor immunohistochemistry has, in various clinical trials yielded conflicting results as to the use of epidermal growth factor receptor immunohistochemistry assay as a companion diagnostic. This has resulted in this test being removed from the licence for the drug panitumumab and not performed in clinical practice for cetuximab. In this review we explore the reasons behind this with a particular emphasis on colorectal cancer, and to suggest a way of resolving the situation through improving the precision of epidermal growth factor receptor immunohistochemistry with quantitative image analysis of digitised images complemented with companion molecular morphological techniques such as in situ hybridisation and section based gene mutation analysis.

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